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Integrated services digital networks

Common management services – Log management – Protocol neutral requirements and analysis

Recommendation ITU-T M.3705



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Recommendation ITU-T M.3705

Common management services – Log management – Protocol neutral requirements and analysis

Summary

Recommendation ITU-T M.3705 provides the requirements and analysis for one of the common management services – log management. This Recommendation is a rewrite of Recommendation ITU-T X.735 under the new methodology specified in Recommendation ITU-T M.3020 to provide a protocol neutral information model for log management.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T M.3705	2013-03-16	2

Keywords

Common management service, log management.

FOREWORD

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The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Recommendation ITU-T M.3705

Common management services – Log management – Protocol neutral requirements and analysis

1 Scope

This Recommendation defines the requirements for basic log management which includes the following: specify what to log, start/suspend/resume/stop logging, retrieve log records, and generate an alarm when encountering certain logging problems. The technique-specific and device-specific event and message logging will be derived from this Recommendation, and the generic logging management objects, attributes and operations will be reused.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T M.3020] Recommendation ITU-T M.3020 (2011), *Management interface specification methodology*.
- [ITU-T M.3160] Recommendation ITU-T M.3160 (2008), *Generic, protocol-neutral management information model*.
- [ITU-T M.3700] Recommendation ITU-T M.3700 (2010), *Common management services – Object management – Protocol neutral requirements and analysis*.
- [ITU-T M.3701] Recommendation ITU-T M.3701 (2010), *Common management services – State management – Protocol neutral requirements and analysis*.
- [ITU-T M.3702] Recommendation ITU-T M.3702 (2010), *Common management services – Notification management – Protocol neutral requirements and analysis*.
- [ITU-T M.3703] Recommendation ITU-T M.3703 (2010), *Common management services – Alarm management – Protocol neutral requirements and analysis*.
- [ITU-T X.680] Recommendation ITU-T X.680 (2008) | ISO/IEC 8824-1:2008, *Information Technology – Abstract Syntax Notation One (ASN.1) – Specification of basic notation*.
- [ITU-T X.701] Recommendation ITU-T X.701 (1997) | ISO/IEC 10040:1998, *Information technology – Open Systems Interconnection – Systems management overview*.
- [ITU-T X.735] Recommendation ITU-T X.735 (1992) | ISO/IEC 10164-6:1993, *Information Technology – Open Systems Interconnection – Systems Management: Log control function*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following term defined elsewhere:

3.1.1 notification [ITU-T X.701].

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 notification log: A managed resource in which notifications are stored. Notification logs contain notification log records. A notification log may represent a physical or a logical/virtual storage, which may not be visible to a manager.

3.2.2 notification log record: A notification log record records track information about when a particular notification entered the notification log and the details of the notification. Each notification log record is associated with one notification.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
EMS	Element Management System
IOC	Information Object Class
IRP	Integration Reference Point
NE	Network Element
NL	Notification Log
NM	Network Manager
NMS	Network Management System
NR	Network Resource
OS	Operations System
UML	Unified Modelling Language
XML	extensible Markup Language

5 Conventions

This Recommendation uses the conventions defined in [ITU-T M.3020] for requirements capture and analysis.

6 Requirements

A general-purpose notification logging mechanism is required to hold notifications related to different functional areas in the network.

This service uses the following services and thus implicitly imports all the requirements defined therein:

- Notification management [ITU-T M.3702]
- State management [ITU-T M.3701]

In addition, the following specific requirements apply for log management as specified in this and subsequent clauses.

6.1 Business level requirements

6.1.1 List of requirements

6.1.1.1 General requirements

Identifier	Definition
REQ-LM-FUN-01	Any notification log must be capable of storing all data related to any type of notification (i.e., any class which extends Notification as defined in [ITU-T M.3702]).
REQ-LM-FUN-02	The notification log control service will allow the selection of notification log records that are to be logged by a management system (NMS or EMS) in a new notification log or a particular existing notification log.
REQ-LM-FUN-03	It will be possible to start and stop logging to a specific notification log or all notification logs.
REQ-LM-FUN-04	The ability for a client system to modify the criteria used in logging notification records.
REQ-LM-FUN-05	Specification of a mechanism to enable notification logging to be suspended and subsequently to be resumed.
REQ-LM-FUN-06	The ability for a client system to retrieve and delete notification log records.
REQ-LM-FUN-07	The ability for a client system to create and delete those notification logs.
REQ-LM-FUN-08	The ability to log partial notifications.
REQ-LM-FUN-09	The manager may request a list of all log activities currently managed by the agent. The agent returns a list of notification log identifiers to the manager. The manager may then use these identifiers to query a log or parts of it.
REQ-LM-FUN-10	The agent will assign a unique identifier to each notification log whether created autonomously by the agent or on the request of a manager.
REQ-LM-FUN-11	All notifications available at the agent for potential transmission shall be logged if requested by a start log request, irrespective of the notification subscriptions and filter settings.
REQ-LM-FUN-12	The notification log record will contain a notification as specified by [ITU-T M.3702].
REQ-LM-FUN-13	The notification log record is time-stamped, allowing the operator to determine the time at which the notification log record was added to the notification log.
REQ-LM-FUN-14	The agent should avoid the logging of notifications resulting from asynchronous alarm synchronization.

6.1.1.2 Status of the notification log state

Identifier	Definition
REQ-LM-FUN-15	The ability for a client system to determine whether the logging characteristics were modified or whether any notification log records have been lost.
REQ-LM-FUN-16	The notification log management system must notify all interested OS about its current state. An event-based approach is used to update OS on the current state of the notification log. To facilitate the notification of attribute or state changes, a notification log has the capability to generate such events according to the object management functions defined in [ITU-T M.3700].
REQ-LM-FUN-17	The notification log management system may also emit notification log creation and log deletion notifications to signal the creation or deletion of a particular log according to the object management functions defined in [ITU-T M.3700].

Identifier	Definition
REQ-LM-FUN-18	To notify OSs about the loss or imminent loss of notification log records, the system is able to emit capacity threshold alarms as defined in [ITU-T M.3703] that alert the subscribed OSs that a capacity threshold has been crossed in a particular notification log. This threshold value may indicate that the notification log is full and incoming notifications shall be dealt with in a predetermined manner set by an operator.
REQ-LM-FUN-19	The system may emit other events to notify an OS of the completion of an I/O intensive operation, such as the deletion of notification log records.

6.1.1.3 Notification log/notification log record retrieval

Identifier	Definition
REQ-LM-FUN-20	An OS may retrieve notification log records by querying a particular notification log with a filter.

The ability of an OS to export some subsets of notification logs maintained by itself to the W3C XML log format is for further study.

6.1.1.4 Notification log full action

Identifier	Definition
REQ-LM-FUN-21	The OS must be able to set the behaviour of a notification log when it becomes full. Two actions are recommended, halt and wrap: – A notification log that halts when full implies the agent should notify the OS by way of generating a capacity threshold alarm. New notifications, which should be logged according to the notification log's filter criteria, are discarded. This behaviour implies that the old notification log records are more important than new ones. – An OS can set the behaviour of the notification log to wrap when full. In this case the notification log behaves like a circular buffer, replacing the oldest notification log records with new ones. This behaviour implies that new notification log records are more important than old notification log records.

6.1.2 Actor roles

The capabilities described in this Recommendation are available and relevant to all agents and managers.

6.1.3 Telecommunication resources

The log management functionality is applicable to all types of telecommunication resources.

6.1.4 High level use case diagrams

The first overview use-case diagram in Figure 1 shows the overall interaction of the Notification log management function.